PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-231432
(43)Date of publication of application : 27.08.1999

(51)Int.Cl. G03B 27/32
H04N 1/393

(21)Application number : 10-075122
(22)Date of filing : 10.02.1998

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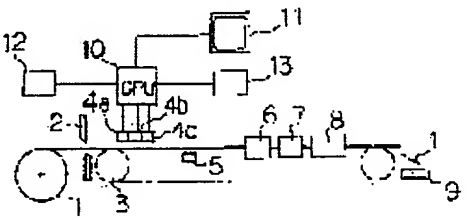
(54) PHOTOSENSITIVE MATERIAL PROCESSOR

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a photosensitive material processor capable of printing an image converted as digital data can be printed on a photosensitive material with an optimum magnification regardless of the shape thereof.
SOLUTION: By a CPU 10, the magnification of the image used at a printing time is properly decided based on the size of a photographic paper 1. Since heads 4a, 4b and 4c are driven so that the image is printed on the paper 1 while being enlarged or reduced based on the decided magnification, the magnification of the image need not be adjusted by a worker at the printing time of the image. Thus, working efficiency is enhanced.



LEGAL STATUS

[Date of request for examination] 04.03.2003
[Date of sending the examiner's decision of rejection]
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
[Date of final disposal for application]
[Patent number]
[Date of registration]
[Number of appeal against examiner's decision of rejection]
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CLAIMS

[Claim(s)]
[Claim 1] In the sensitive-material processor which can be burned on sensitive material in the image changed into the digital data Based on the dimension of said image and said sensitive material, for the scale factor which a decision means for it to be burned and to determine the scale factor of said image at the time, and said decision means determined Expand or reduce said digital data and it consists of a baking means which can be burned on said sensitive material in said image. The image based on said digital data expanded or reduced by the scale factor of said decision means is a sensitive-material processor characterized by having magnitude which protrudes said sensitive material at least.
[Claim 2] The sensitive-material processor according to claim 1 characterized by establishing a modification means to change the scale factor which said decision means determined.
[Claim 3] Said modification means is a sensitive-material processor according to claim 2 characterized by changing the scale factor which said decision means changed for every part of said image.
[Claim 4] It is the sensitive-material processor according to claim 1 to 3 which said sensitive material is put side by side, and determines the scale factor of said image to said each of sensitive material with which said decision means was put side by side, respectively.
[Claim 5] Said digital data is a sensitive-material processor according to claim 1 to 4 characterized by being generated by reading the transmitted light of an image.
[Claim 6] Said digital data is a sensitive-material processor according to claim 1 to 4 characterized by being generated by reading the reflected light from an image.
[Claim 7] In the sensitive-material processor which can be burned on the sensitive material beforehand cut out by predetermined magnitude in the image changed into the digital data before being burned Based on the dimension of said image and said sensitive material, for the scale factor which a decision means for it to be burned and to determine the scale factor of said image at the time, and said decision means determined Expand or reduce said digital data and it consists of a baking means which can be burned on said sensitive material in said image. The image based on said digital data expanded or reduced by the scale factor of said decision means is a sensitive-material processor characterized by having magnitude which protrudes said sensitive material at least.
[Claim 8] The baking scale factor of said image is a sensitive-material processor according to claim 1 or 7 with which length and a longitudinal direction are the same scale factors, and are characterized by setting length and a longitudinal direction as the scale factor for which a pearlitic rim does not appear.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] About the processor of sensitive material, especially this invention reads a photographic film or a manuscript as digital data, and relates to the processor which can be burned on sensitive material, such as printing paper, in this.
[0002]
[Description of the Prior Art] In recent years, the processing technique of digital data progresses, for example, the image of a negative film [finishing / development] and the image on a manuscript are read as digital data, and it is performed that this image can be burned on printing paper.
[0003]
[Problem(s) to be Solved by the Invention] In the place, when a copying machine etc. copies a manuscript, voiding a perimeter is usually performed so that the image on a manuscript may not go out. When in other words copying a manuscript, the copied manuscript will usually be in a condition "with marginal." On the other hand, in the photograph in recent years, it is common that "with no edge" is usually supposed, therefore an image is formed to the edge of printing paper.
[0004] However, it is required that the image of a negative film [finishing / development] is read as digital data, and this image should be made "with no edge" when it can be burned on printing paper. On the other hand, according to the conventional technique, when there was this demand since it could be beforehand burned as "those with marginal" and the scale factor at the time is decided so that the image read as digital data may not go out, the operator had to change the scale factor of an image in detail. However, the modification had to be based on handicraft and had required considerable time and effort.
[0005] Furthermore, the image near a square configuration was read, and it considered as the digital data, and was obliged to the mode of whether this is made as for a big edge to the right and left, when it can be burned on oblong printing paper, or the upper and lower sides of an image go out greatly.
[0006] On the other hand, although changing the size of printing paper according to an image is also considered, generally it is thought that it is difficult to change the size of the printing paper used for years. Therefore, a certain policy which conquers the difference in the configuration of an image and printing paper is needed.
[0007] This invention is not concerned with the configuration of the image changed as digital data in view of the trouble of this conventional technique, but aims at this image being burned on sensitive material for the optimal scale factor, and offering a possible sensitive-material processor.
[0008]
[Means for Solving the Problem] That the above-mentioned purpose should be attained the sensitive-material processor of this invention A decision means to be the sensitive-material processor which can be burned on sensitive material in the image changed into the digital data, and for it to be burned and to determine the scale factor of said image at the time based on the

dimension of said image and said sensitive material, Said digital data is expanded or reduced for the scale factor which said decision means determined. It is characterized by being burned, consisting of a means and the image based on said digital data which can be burned on said sensitive material in said image and which was expanded or reduced by the scale factor of said decision means serving as magnitude which protrudes said sensitive material at least.
[0009] The sensitive-material processor of this invention furthermore, the image changed into the digital data A decision means to be the sensitive-material processor which can be burned on the sensitive material beforehand cut out by predetermined magnitude before being burned, and for it to be burned and to determine the scale factor of said image at the time based on the dimension of said image and said sensitive material, Said digital data is expanded or reduced for the scale factor which said decision means determined. It is characterized by being burned, consisting of a means and the image based on said digital data which can be burned on said sensitive material in said image and which was expanded or reduced by the scale factor of said decision means serving as magnitude which protrudes said sensitive material at least.
[0010]
[Function] According to the sensitive-material processor of this invention, based on the dimension of said image and said sensitive material, for the scale factor which a decision means for it to be burned and to determine the scale factor of said image at the time, and said decision means determined Expand or reduce said digital data and it consists of a baking means which can be burned on said sensitive material in said image. The image based on said digital data expanded or reduced by the scale factor of said decision means Since it has magnitude which protrudes said sensitive material at least, in order to make the variation in the size of sensitive material (printing paper) suit, at the time of baking of this image, it becomes unnecessary for an operator to adjust the scale factor of an image, and, thereby, he can aim at improvement in working capacity.
[0011]
[Embodiment of the Invention] Hereafter, the gestalt of operation by this invention is explained with reference to a drawing. Drawing 1 is the front view of the sensitive-material processor concerning the gestalt of the 1st operation. In drawing 1 , the printing paper 1 which became roll-like is cut out by predetermined die length with a cutter 2, is put on the conveyor-like transport device 3, and is conveyed. The printing paper 1 conveyed by the transport device 3 Three heads 4a and 4b, It exposes in the mode later mentioned in case the lower part of 4c (LED respectively corresponding to colors R, G, and B) is passed. It is printed on a rear face by the printer 5, negatives are developed in the continuing development section 6, and it is established in the fixing section 7, and after washing and drying in the rinsing section 8, it is stored in a stores dept. 9.
[0012] Heads 4a, 4b, and 4c are connected to CPU10. Furthermore, CPU10 is connected to the display 11, the film scanner 12, and the flat-bed scanner 13.
[0013] A film scanner 12 can read the transmitted light, can change an image into digital data, and can read now the image in the 1 piece of the negative film of a photograph. A flat-bed scanner 13 can read the reflected light, can change an image into digital data, and can read now images, such as a manuscript with which the black alphabetic character was printed by the white ground. Since any configuration of a scanner is known well, the detailed configuration is not indicated.
[0014] It is transmitted to CPU10 from each scanner, and this digital data is read into the memory in CPU10. Here, after CPU10 processes digital data, it transmits a driving signal to Heads 4a, 4b, and 4c, and exposes printing paper.
[0015] Next, processing of digital data performed within CPU10 is explained. Drawing 2 is drawing showing the dimension relation between one piece of a negative film, and printing paper, drawing 2 (a) shows a negative film and drawing 2 (b) shows printing paper.
[0016] the size of one piece of the negative film Ng shown in drawing 2 is usually oblong — it is A= 36mm and longwise — it is B= 24mm. on the other hand, the size of printing paper 1 is oblong in this example — it is C= 127mm and longwise — it is D= 89mm. Although it is clearer than this dimension relation, the ratio which was oblong and broke vertical length, respectively is about

0.67 in a negative film Ng, and is about 0.70 in printing paper 1. That is, the direction of printing paper is a rectangle near a square. Therefore, in having expanded one piece of a negative film Ng simply, it has not been settled suitable for printing paper 1, and a condition "with marginal" may also be produced depending on the case. In addition, with a lengthwise direction, it considers as the direction of a short hand of a rectangle screen.

[0017] Then, CPU10 calculates the scale factor of the image in this case suitably, and enables it to burn an image on printing paper 1 for this scale factor. The contents of processing in this CPU10 are made into a flow, and are shown in drawing 3 .

[0018] In step S101 of the flow shown in drawing 3 , first, in case CPU10 reads digital data from a film scanner 12 or a flat-bed scanner 13, it recognizes the magnitude of the image read based on these data from the first. CPU10 reads the dimension of printing paper 1 into coincidence. This dimension may be beforehand memorized by the memory in CPU10, and an operator may be made to input it.

[0019] In continuing step S102, CPU10 determines a suitable scale-factor value from the magnitude of an image from the first, and the dimension of printing paper, and displays it on a display 11. It is set as the somewhat larger scale factor in the case of the example shown in drawing 2 than a scale-factor value (namely, 127 / 36**3.53) which makes in agreement the breadth of one piece of a negative film Ng, and printing paper 1. When it is set as such a scale-factor value, it will be slightly cut off near the one piece of an image in a negative film Ng near the margo inferior (side edge of the longitudinal direction of a rectangle size piece) near the upper limb, a pearlitic rim will arise, and it can be burned on printing paper 1. Therefore, if a somewhat larger scale factor than a scale factor which makes a dip in agreement is made to agree, a pearlitic rim will not appear anywhere. Namely, what is necessary is to be larger than 89 / 24= 3.71, for example, just to set up 3.8 times. If it sets up beyond this scale-factor value, it will surely be in a "with [no edge]" condition.

[0020] The image expanded with this scale-factor value can be checked on a display 11, and in that case, the field of printing paper 1 also overlaps an image by a frame etc., and it is shown. Then, when an operator does the last check of whether main photographic subjects are cut off by observing this display 11 (step S103) and the operator who judged that it was satisfactory pushes a non-illustrated carbon button (un-illustrating) The printing paper 1 in which it came whenever drove Heads 4a, 4b, and 4c, it could be burned by that cause, processing was performed (step S104) and CPU10 was shown in ** and drawing 2 (b), and the image was formed can be obtained.

[0021] On the other hand, when an operator asks for correction of a scale-factor value for the reasons of main photographic subjects being cut off in step S103, and an operator operates a non-illustrated keyboard, a scale-factor value is corrected (step S105), and the image expanded for the scale-factor value after correction and its scale factor is displayed on a display 11. An operator can check again the image based on the scale-factor value after correction (step S103), and can take a required measure (steps S104 and S105).

[0022] Next, the gestalt of another operation of this invention is explained. Drawing 4 is drawing showing the dimension relation between the square-like manuscript image Dt and printing paper, drawing 4 (a) shows a manuscript image and drawing 4 (b) shows printing paper.

[0023] Since the manuscript image Dt shown in drawing 4 is a square-like, it is oblong A'= longwise A'. as mentioned above, the size of printing paper 1 is oblong — it is C= 127mm and longwise -- it is D= 89mm.

[0024] If a scale-factor value (namely, C/A') which makes in agreement the horizontal length of the manuscript image Dt and printing paper 1 is set up like the negative film Ng shown in drawing 2 in the case of the manuscript image Dt shown in drawing 4 , it will be able to be burned, the upper part and the lower part of the manuscript image Dt will sometimes be cut off over the considerable range, and it is not desirable.

[0025] On the other hand, if a scale-factor value (namely, D/A') which makes in agreement the vertical length of the manuscript image Dt and printing paper 1 is set up, it can be burned, and the big burster trimmer stacker feature by both side of printing paper 1 generates and is not sometimes desirable.

[0026] So, in such a case, with directions of an operator, CPU10 divides the printing paper 1 which can be burned in the manuscript image Dt at central field 1a (oblong C') and flank field 1b, and trisection of the manuscript image Dt is carried out to a longitudinal direction. Furthermore, CPU10 is set to central field 1a. While setting up a scale-factor value (namely, scale factor which does not produce a pearlitic rim for a somewhat larger scale factor than D/A' or this) which makes in agreement the vertical length of the central part of the manuscript image Dt, and printing paper 1 The depth magnification value of flank field 1b is set as D/A', and the longitudinal direction scale-factor value of flank field 1b is set as (C-C')/(2A/3).
[0027] If it is set as such a scale-factor value, in central field 1a of printing paper 1, the central part to which trisection of the manuscript image Dt was carried out can be expanded as it is, and can be burned, and, on the other hand, it can be burned in the form where the both-sides part of the manuscript image Dt was extended horizontally, in flank field 1b, respectively. That is, although distortion arises somewhat in the image corresponding to the both-sides part of the manuscript image Dt in the condition that an important image is in a central part in the manuscript image Dt in many cases, therefore it was able to be burned on printing paper 1 although the both-sides part of the manuscript image Dt which was able to be burned on flank field 1b will have produced some distortion, it can print simple by the method of such treatment.
[0028] Drawing 5 is the perspective view showing the modification of the gestalt of this operation shown in drawing 1 . In drawing 5 , a cutter and a transport device omit and are shown. In drawing, this printing paper 1 is cut out by the non-illustrated cutter, two roll-like printing paper 1 is put side by side, it is conveyed so that it may cross directly under the heads 4a, 4b, and 4c of each single, and an image is formed in each printing paper 1 in that case. A cutter may be made to perform decision after exposure.
[0029] In this modification, since Heads 4a, 4b, and 4c are partially controlled by CPU10, a scale-factor value can also be changed in left printing paper 1 and the printing paper 1 of the method of the right, so that it may differ mutually.
[0030] Moreover, although trisection of the manuscript was carried out and the photography scale factor was changed in a center and the side with the gestalt of the above-mentioned operation, with the gestalt of the following operations, the whole region is made into a single projection scale factor, and the scale factor of the vertical direction and a longitudinal direction supposes that it is the same. When the vertical direction and a longitudinal direction are expanded as the same scale factor, the image part in which printing paper (print) size has not entered on printing paper by the criterion, Hi-Vision, a panorama, etc. changes with differences of the class of film, 135 types, APS, and 110 types again. Although there is a trouble that, as for the gestalt of this operation, a boundary part will be cut off, a scale-factor setup can be carried out simple and it is one mode of this invention.
[0031] As mentioned above, although this invention has been explained with reference to the gestalt of operation, this invention is limited to the gestalt of the above-mentioned implementation, and should not be interpreted, but, of course, modification and amelioration are possible suitably. For example, when it is going to form a series of images from a negative film, it is also possible for it not to be necessary to take a check of an operator in detail, and to process by the ability being automatically burned based on the set point of CPU10.
[0032]
[Effect of the Invention] According to the sensitive-material processor of this invention, based on the dimension of an image and sensitive material, i.e., printing paper, for the scale factor which a decision means for it to be burned and to determine the scale factor of said image at the time, and said decision means determined Expand or reduce said digital data and it consists of a baking means which can be burned on said sensitive material in said image. The image based on said digital data expanded or reduced by the scale factor of said decision means Since it has magnitude which protrudes said sensitive material at least, in order to make the variation in the size of sensitive material (printing paper) suit, at the time of baking of this image, it becomes unnecessary for an operator to adjust the scale factor of an image, and, thereby, he can aim at improvement in working capacity.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the front view of the sensitive-material processor concerning the gestalt of the 1st operation.
[Drawing 2] It is drawing showing the dimension relation between one piece of a negative film, and printing paper, and drawing 2 (a) shows a negative film and drawing 2 (b) shows printing paper.
[Drawing 3] It is drawing in which making the contents of processing in CPU10 into a flow, and showing them.
[Drawing 4] It is drawing showing the dimension relation between the square-like manuscript image Dt and printing paper, and drawing 4 (a) shows a manuscript image and drawing 4 (b) shows printing paper.
[Drawing 5] It is the perspective view showing the modification of the gestalt of this operation shown in drawing 1 .
[Description of Notations]
1 Printing Paper
2 Cutter
3 Transport Device
4a, 4b, 4c Head
5 Printer
6 Development Section
7 Fixing Section
8 Rinsing Section
9 Stores Dept.
10 CPU
11 Display
12 Film Scanner
13 Flat-bed Scanner
Ng Negative film
Dt Manuscript image

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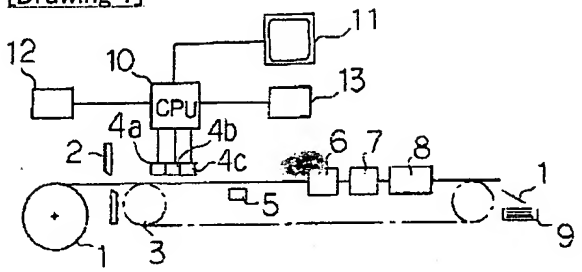
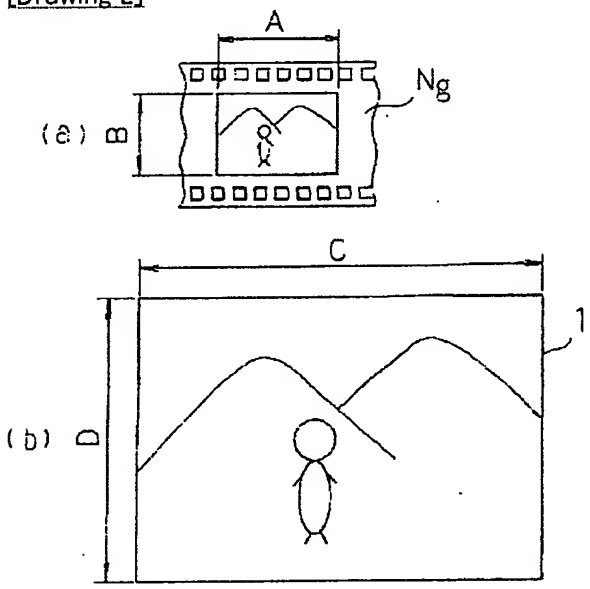
DRAWINGS

[Drawing 1]



[Drawing 2]



[Drawing 4]

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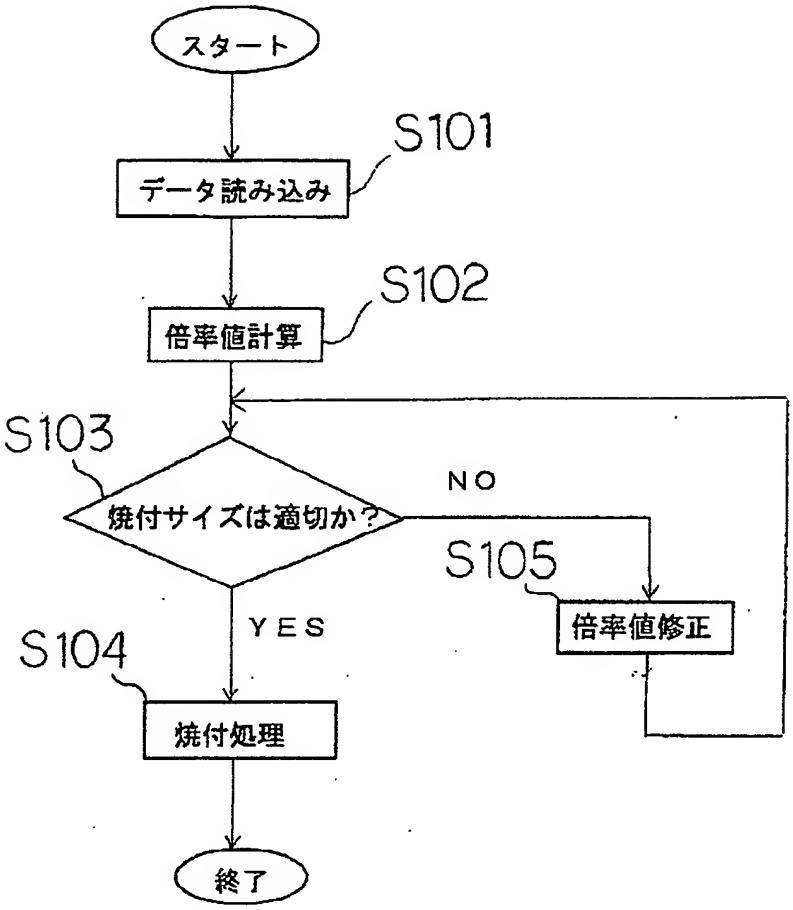

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